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ABSTRACT

This practicum was designed to expand the scope of the inservice mathematics manipulative training program to address the lack of parent and teacher understanding of the use of manipulatives that are used by Chapter I math tutors to remediate students. A second aim was to acquaint and assist parents and teachers with remediation of educationally deprived elementary school aged children by using manipulatives. A parent survey and needs assessment was used to develop and facilitate inservice mathematics manipulative training sessions which focused on helping parent and teachers understand manipulatives for remediating basic mathematics skills. Included in this study are the: (1) "Introduction"; (2) "Study of the Problem"; (3) "Anticipated Outcomes and Evaluation Instruments"; (4) "Solution Strategy"; and (5) "Results, Conclusions and Recommendations". Appended are a copy of the parent survey, pre- and post- parent/teacher surveys, and miscellaneous documents. (Author/KR)

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Development of a Math Manipulative Parent/Teacher Training Program for Remediating Elementary Chapter I Students

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Robert Allen

Cluster 25

A Practicum II Report to the Ed.D. Program
in Early and Middle Childhood
in Partial Fulfillment of the Requirements
for the Degree of Doctor of Education

NOVA UNIVERSITY

1990

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PRACTICUM APPROVAL SHEET

This practicum took place as described.

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This practicum report was submitted by Robert Allen under the direction of the adviser listed below. It was submitted to the Ed.D. Program in Early and Middle Childhood and approved in partial fulfillment of the requirements for the degree of Doctor of Education at Nova University.

Approved:

Date of Final Approval of Report

Georgianna Lowen, Ed.D., Adviser

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ABSTRACT

Development of a Chapter I Elementary Math Manipulative Parent/Teacher Training Program.
Allen, R., 1990: Practicum Report, Nova University Ed.D. Program in Early Childhood.
Descriptors: Math Inservice/Math Skills/Parent Involvement/Elementary School/Math Remediation/Program Development/Mathematic Research/Manipulatives.

This practicum was designed to expand the scope of the inservice math manipulative training program to address the lack of parent and teacher understanding of the use of manipulatives that are used by Chapter I math tutors to remediate students. A second aim was to acquaint and assist parents and teachers with remediation of educationally deprived elementary school aged children by using manipulatives.

The writer conducted a parent survey and needs assessment. The writer also developed and facilitated inservice math manipulative training sessions which focused on helping parents and teachers understand manipulatives for remediating basic math skills.

A summary of the final parent survey results revealed that all of the 336 parent and teacher participants' understanding of basic addition skills increased above the 75% predicted outcome by 17%, with an overall increase of 92%. The parents' and teachers' understanding of basic subtraction skills increased above the predicted 75% outcome by 16%, with an overall increase of 92%. The parents' and teachers' understanding of basic multiplication skills reflected a 20% increase above the 75% predicted outcome and a 92% increase overall. Results for the parents' and teachers' understanding of basic division skills increased 18% above the predicted 75% and a 95% increase overall. The majority (96%) of the parent and teacher respondents rated the inservice program excellent, and a 3% rating of good overall.

CHAPTER I

INTRODUCTION

Description of Community

Chapter I is part of the largest federal aid-to-education program in our country's history. The funds support activities which meet the needs of educationally deprived children in schools with relatively large numbers of children from low income families.

The Chapter I math remediation program serves 51 public elementary schools in the district. Federal funds support the need of educationally deprived math students in the district's rural and inner-city schools. There are approximately 3000 students qualifying for math services with a racial and ethnic composition of 64.35% White, 24.58% Black, 8.60% Hispanic, and 2.4% Asian/Pacific Islander.

This practicum focused on the involvement of over 200 parents and the Chapter I math tutors, classroom teachers, district parent education staff, and principals from four school sites.

The sites chosen for this practicum are four Chapter I elementary schools located in the north,

south, east and west quadrants of the inner-city section of the district.

The four practicum school sites conduct year-round education programs, and are located in predominantly white low and middle income communities. The majority of the minority Black and Hispanic students are bused in from predominately low socio-economic areas within the inner city. The Black and Hispanic population makes up between 40 through 50 percent of each practicum school site's current enrollment.

The following four practicum elementary school sites, including their Chapter I students math populations as of September 10, 1989 are:

1. School A with a population of 53 students.
2. School B with a population of 73 students.
3. School C with a population of 66 students.
4. School D with a population of 71 students.

Math remediation is provided for educationally disadvantaged 1st, 2nd, and 4th grade Chapter I students in the target elementary school programs. The students are eligible for math services if their total score on the district's comprehensive test is at or below the 35th percentile.

Author's Work Setting and Role

The writer's primary responsibility is supporting the Chapter I program consultants and district resource teachers in the implementation of the district's Chapter I program. The writer monitors program compliance, plans and interfaces with math tutors and teachers, provides consistency in curriculum, and serves as a communication link between the program consultants and the school. The secondary responsibility of the writer is promoting parent/community participation at the district and local school levels, and ensuring that the program meets federal requirements of parental consultation in the planning, implementation, and evaluation of the math program.

CHAPTER II

STUDY OF THE PROBLEM

Problem Description

The Chapter I parents were provided with only an initial orientation overview at the local school level about the manipulative approach to remediating math skills.

Briefly stated, the problem was a lack of parent and teacher understanding of the use of manipulatives used by the Chapter I math tutors to remediate students in math.

The use of manipulatives to teach math was not fully understood or accepted by many classroom teachers, principals and parents of Chapter 1 children.

The attendance at the parent orientation meetings was generally low and the parents who did attend, usually went away confused about the use of manipulatives and how they were being used by Chapter I math tutors and classroom teachers to teach and remediate math skills.

Many Chapter I parents voiced their concern at the district and local school levels for asisstance to help them better understand the use of math manipula-

tives and their need for guidance so that they could provide additional enhancement of math skills for their children at home.

Problem Documentation

The writer conducted a random sample telephone survey of 100 selected Chapter I parents from the district's 51 public schools served by the Chapter I program (see Appendix A).

Table 1.

Telephone Survey Results

Item	Yes	No
1	100%	0%
2	60%	40%
3	0%	100%
4	0%	100%
5	10%	90%
6	100%	0%
7	100%	0%

Result percentages are rounded off.

A general summary of the parent comments reflected that a majority (95%) of the respondents indicated that they did not know enough about the math program to make any comments. All of the respondents (100%) commented that they wanted more information about math manipulatives and how they could help their children.

The writer reviewed teacher and Chapter I math tutors lesson plans and observed several classes of math instruction and remediation at the four practicum school sites. The writer found that both teacher and math tutors were not adequately skilled nor knowledgeable with modeling concepts using appropriate manipulatives for specific math skills instruction or remediation.

The Chapter I program must meet federal requirements of parental consultation in planning, implementation, and evaluation of the program. On a biannual basis, a district parent advisory council meeting is held to review and discuss the evaluation results of the most recent school year, and to gather parental input for planning the upcoming school year's grant. The minutes and parent survey summary of last general parent district advisory meeting reflected that parents were given the opportunity to discuss program results and provide input (see Appendix B).

Table 2 survey summary reflects the results of 24 parent respondents attending the November 15, 1988 District Advisory Council meeting.

Table 2.

District's Parent Advisory Council Survey Results

Item	Yes	No	No Comments
1	24	0	0
2	18	6	0
3	16	8	0
4	20	4	0
5	5	19	0
6	7	0	17
7	18	0	6
8	16	0	14
9	7	0	17

The parents were asked to provide comments for items seven and eight survey questions for Table 2. A general summary of parent comments for item six of the survey reflected that 19 of the 24 parents respondents were not aware of the types of programs offered by the program, and 14 wanted more information about math

materials to help make learning fun. A general summary of parent comments for items seven and eight reflected that 21 of the 24 parent respondents indicated that they had seen improvement in their childrens' work and improved enthusiasm for math remediation.

Causative Analysis

There was an insufficient training program and materials for parents to assist in addressing the math needs of their children.

The Chapter I program lacked a math manipulative program that provided for collaboration between parents, teachers and administrators.

Teachers who have had difficult experiences with demanding parents preferred to avoid working with them. Many of the Chapter I schools viewed parent involvement as a legal requirement only, and did not see parents as equal partners in the educational process.

Parents were reluctant to participate in their children's Chapter I math program because they were not sure whether they were qualified to play an active role. Many classroom teachers and parents interviewed reported that they experienced great frustration in attempting to obtain appropriate training in the use of math manipulatives.

The traditional paper and pencil method of math remediation has proven to be ineffective based on feedback from district test results and teacher interviews. Many of the classroom teachers and tutors felt that their students fail to master fundamental concepts of addition, subtraction, multiplication and division because of classroom teachers and math tutor's inability to use manipulatives in remediating math skills.

The writer's work environment was best described as being the independent characterization. Parents came to school for problem situations to be resolved, the special event their child was involved with, and for open house. They were not involved with, or did not participate in school life. Every day school activities did not penetrate family life much beyond parents looking at their children's papers and working with them about once a week. Reinforcement of concepts introduced and skills taught generally did not occur. Enriching experiences were lacking, as was parent involvement on a daily and on-going basis. The impact on the level of educational attainment obtained by the child was diminished in this independent environment.

The Related Literature

Laureau and Benson (1984) suggested that parents devote much time to academic growth and development of their children. Teachers, however, must carefully allocate to all class members. Home/school partnerships enable parents to use their knowledge to assist in the academic growth of a larger number of students. The teacher and the parent roles become more closely related in the child's educational enhancement. The gap between the home/school partnership will continue to widen if teachers don't reach out and develop sensitivity to the needs of parents and recognize them as an important influence in students' achievement.

Seely (1983) suggested that parent involvement in their child's education has been identified as a critical variable in raising educational productivity. The investment of parental time for their children may differ as much as five times from family to family on the impact of the capacity to profit from educational experiences.

Further research by Seely (1983) indicated that social, economic and cultural differences may impact parental participation and involvement, which may affect the benefit a child obtains from the school experience. The family life is fundamentally inde-

pendent of school or is characterized by interdependence between family and school.

Lamm (1986) suggested that school have developed a monopoly to the exclusive rights of educating children. School systems exercise their dominance by regulating the quality and pace of student learning. The parent is provided little or no interaction with the school, or even the choice of which school their children will attend. The lack of parent involvement has created a passive reluctance to participate in the education of their children.

Kennedy (1986) suggested that teachers feel strongly about the benefits of manipulatives to teach math concepts. Classroom teachers who experience the use of manipulatives in teaching math have come to realize the value of manipulatives to a strong base for math concepts. Manipulatives that are selected appropriately by the classroom teacher and used correctly with children can improve academic skills in math as well as generate more enthusiasm toward learning.

Young (1983) suggested a variety of manipulatives should be considered when teaching a specific skill. It is critical that teachers be aware of the types of manipulatives that they can use for each ability level. Teachers must become knowledgeable about the use of

manipulative strategies that help students to be able to transfer written symbols from the text. Manipulatives must be utilized as a major part of the math instruction. The students are helped to see the relationship between the manipulative materials and the text.

Bright (1986) contented that the increased use of manipulatives by teachers could create problems with the student's ability to make the transfer from symbols to manipulatives. The same concepts should be emphasized with both symbols and manipulatives to help the students understand the connections. Appropriate manipulatives can be used adequately to teach a variety of generalized concepts.

Moser (1986) suggested that manipulatives can be a real asset to those students who may need additional remediation with specific concepts. Manipulatives are most effective at the students early stages of developmental learning. In addition to their use, consideration should be given to the appropriateness for instruction, and/or remediation.

Swick, Hobson and Duff suggested that schools assist, guide, support and involve parents by providing education programs that help parents contribute positively toward the educational growth of their children. Teachers and parents are encouraged to share the com-

mitment and responsibility for developing a consistent environment, experiences and materials which enhance learning. Parents, teachers and administrators can collaborate cooperatively to develop high quality training programs for the improvement of both parents and staff. The parents and teachers will then be better able to jointly develop a variety of learning projects and materials to meet the educational needs of children.

CHAPTER III

ANTICIPATED OUTCOMES AND EVALUATION INSTRUMENTS

Statement of General Goals

The following goals were projected for this practicum: To increase the Chapter I parents' and teachers understanding of the math manipulative program used at the school, and the development and implementation of a training program at the target practicum schools that would acquaint and assist both parents and teachers with utilizing manipulatives to reinforce math skills with their children.

The projected practicum goals included: (a) to familiarize parents and teachers with manipulatives used in the Chapter I program, (b) to help parents and teachers gain a better understanding of methodologies used with their children, (c) to provide opportunities for students, parents and teachers to communicate, and (d) interaction with developing learning materials to be used at home and school.

Behavioral Expectations

The following specific objectives were projected for this practicum:

Objective One: Seventy-five percent of the parents and teachers will be able to understand the use of manipulatives used by Chapter I tutors to remediate students in basic addition skills as measured by a comparison of the initial parent/teacher survey result questions (see Appendix C) and the final parent/teacher survey result questions on the final parent/teacher survey.

Objective Two: Seventy-five percent of the parents and teachers will be able to understand the use of manipulatives used by Chapter I tutors to remediate students in basic subtraction skills as measured by a comparison of the initial parent/teacher survey result questions (see Appendix D) and the final parent/teacher survey result questions on the final parent/teacher survey.

Objective Three: Seventy-five percent of the parents and teachers will be able to understand the use of manipulatives used by Chapter I tutors to remediate students in basic multiplication skills as measured by a comparison of the initial parent/teacher survey result questions (see Appendix E) and the final parent/teacher survey result questions on the final parent/teacher survey.

Objective Four: Seventy-five percent of the parents and teachers will be able to understand the use of manipulatives used by Chapter I tutors to remediate students in basic division skills as measured by a comparison of the initial parent/teacher survey result questions (see Appendix F) and the final parent/teacher survey result questions on the final parent/teacher survey.

Evaluation Instruments

The following instruments designed by the writer were to be used to evaluate the practicum goals and objectives:

1. An initial parent/teacher survey, (see Appendix C) consisting of five parent questions and five teacher questions requesting comments that were designed to measure how well both parent and teachers understood the use of math manipulatives used by Chapter I math tutors to remediate both addition skills.
2. An initial parent/teacher survey, (see Appendix D) consisting of five parent questions and five teacher questions

requesting comments that were designed to measure how well parents and teachers understood the use of math manipulatives used by Chapter I math tutors to remediate basic subtraction skills.

3. An initial parent/teacher survey, (see Appendix E) consisting of five parent questions and five teacher questions requesting comments that were designed to measure how well parents and teachers understood the use of math manipulatives used by Chapter I math tutors to remediate basic multiplication skills.
4. An initial parent/teacher survey, (see Appendix F) consisting of five parent questions and five teacher questions requesting comments that were designed to measure how well parents and teachers understood the use of math manipulatives used by Chapter I tutors to remediate basic division skills.
5. A final parent/teacher survey, (see Appendix C) consisting of five similar parent and five similar teacher questions that were presented on the initial parent/teacher survey was pro-

vided with a request that they respond with comments. This survey was to be compared to the initial parent/teacher survey to see how well the parents and teachers understood the use of math manipulatives used by Chapter I tutors to remediate basic addition skills.

6. A final parent/teacher survey, (see Appendix D) consisting of five similar parent and five similar teacher questions that were presented on the final parent/teacher survey was to be provided with a request that they respond with comments. This survey was to be compared to the initial parent/teacher survey to see how well the parents and teachers understood the use of math manipulatives used by Chapter I math tutors to remediate basic subtraction skills.
7. A final parent/teacher survey, (see Appendix E) consisting of five similar parent and five similar teacher questions that were presented on the initial parent/teacher survey was to be provided with a request that they respond with comments. The survey was to be compared to the initial parent/teacher survey to see how well the parent and teachers understood the use of math manipulatives used by Chapter I

tutors to remediate basic multiplication skills.

8. A final parent/teacher survey, (see Appendix F) consisting of five similar parent and teacher questions that were presented on the initial survey was to be provided with a request that they respond with comments. This survey was to be compared to the initial parent/teacher survey to see how well the parents and teachers understood the use of math manipulatives used by Chapter I tutors to remediate basic division skills.

The first objective was to be measured by the inital parent/teacher survey result questions, and was to be compared to the final parent/teacher survey results for questions in Appendix C.

The second objective was to be measured by the initial survey result questions, and was to be compared to the final parent/teacher survey result questions in Appendix D.

The third objective was to be measured by the initial parent/teacher survey result questions, and was to be compared to the final parent/teacher survey results for questions in Appendix E.

The fourth objective was to be measured by the initial parent/teacher survey result questions, and was

to be compared to the final parent/teacher survey questions in Appendix F.

CHAPTER IV

SOLUTION STRATEGY

Discussion and Evaluation of Solutions

Consistent research findings during the literature search revealed that children with more positive attitudes and higher achievement levels in math come from homes in which there is a wide range of math materials available.

Ost (1988) suggested policy committment for educational programs that involves interaction between teacher and parents. When parents themselves are able to model the process, the children will develop positive attitudes and higher achievement.

Teachers can encourage parents to learn the strategies of how their children are being taught at school to provide skill enhancement at home. Teachers can provide parents with materials and suggested activities to remediate skills taught at school (U.S. Department of Education, 1986).

Herbert (1985) suggested the use of manipulatives to motivate, stimulate and introduce mathematic concepts. Manipulatives can be used like a game to inspire students to learn and have fun at the same

time.

A review of the literature revealed a number of methods and strategies which could prove beneficial toward improving the problem.

Weidman and LeMahieu (1985) suggested that schools should place more emphasis on learning programs after the school day that allows parents to develop better understanding of their children, and how their children perceive themselves.

Parent involvement programs recognize parents as an important asset to the school. This allows the school to make full use of the benefits and contributions that parents have to offer by providing encouragement, support, training, and materials for committed parents who are willing to work with their children at home.

Flexer and Topping (1988) suggested that the school makes available to parents ideas and materials on how to teach mathematics. Teachers are encouraged to conduct regularly scheduled meetings to teach parents how to make and use activities to reinforce math skills at home. The parents are given insight on how to use familiar items at home from the child's environment.

Williams (1985) suggested that success for parents as educators is achieved by planning workshops through the use of manipulative household items. The program

is based on providing information for parents to help meet the skill needs of their children.

Baratta-Lorton (1979) suggested that math concept development for students are obtained by parents using familiar, manipulative, concrete materials from the child's home environment. The use of manipulatives help the child develop a better understanding of new concepts.

Kennedy (1986) concluded that manipulative experiences with different objects give the child a better image of concepts and ideas. Appropriate use of manipulative materials will enhance learning and problem solving skills.

Description of Selected Solutions

A detailed description of the writer's solution included providing workshop training for parents and teachers with hands-on manipulative activities on the use of a variety of manipulatives that included attribute blocks, unifix cubes, base ten blocks, cuisenaire rods, counting sticks, and chips. Many of the manipulatives that were found in all four target school sites and most of the family homes, but received little or no use because of a lack of knowledge and understanding of how to apply them appropriately.

The solution was to help the parents and teachers get comfortable with the use of manipulatives. Instruction for each training session was developed using the following detailed activity format steps:

1. Explain the problem or concept to be learned.
2. Select the appropriate manipulative.
3. Model the appropriate use of several manipulatives for the problem and/or concept.
4. Guide parents and teachers through several practice examples for each concept.
5. Allow the participants to work sample problems on their own during and between sessions on the concepts discussed.
6. Review, evaluate, and explain solution steps using the appropriate manipulatives for each concept.

For each session the parent and teacher participants were divided into small groups and each group was given an addition, subtraction, multiplication, and division problem to solve using the appropriate manipulative. The practicum writer started each session with simple examples and then moved on to problems that were more difficult. Each group was given an opportunity to discuss and illustrate how they arrived at their solution using an appropriate manipulative. This solution step helped parents and teachers better

understand how the problems were solved and their relationshop to the algorithms steps.

This writer selected to provide parent programs that emphasize the importance of parent involvement in reinforcing math skill at home. Stenmark, Thompson, and Cossey (1986) suggested a family math program utilizing manipulatives. The manipulatives are used to reinforce math skills for children at home.

The writer offered parents a math manipulative training program that included opportunities for parents to work with the school and their children. Becker and Epstein (1982) emphasized the benefits and importance placed on parent involvement. This involvement is related to conducting tutorial learning activities by parents for their children in the home.

Suydam (1984) advocated the use of manipulative materials and demonstrations. This method is used in order to produce greater math achievement.

The writer felt that this solution worked because the parents were provided with skills and materials to stimulate participation in their child's Chapter I math program. The interaction between the home and school helped parents to help their children become better students.

The program provided opportunities for parents and teachers to communicate concerns and ask questions

about math services provided to their children by Chapter I math tutors.

The solution was selected to provided the parents and teachers and tutors with the skills to stimulate the enhancement of math skills for children in the home. The interaction between the home and school helped their children become better math students and allowed the schools to provide the best possible math remediation program for children.

Report of Action Taken

The first step included planning meetings with the target practicum school site principals, Chapter I staff and the curriculum resource teachers to discuss (a) the goals and objectives of the program, (b) needs expressed by the parents and teachers, (c) scheduled training dates, (d) assistance needed for implementation, and (e) suggestions for manipulative activities based on the skill needs of the students.

The second step included: (a) planning math manipulative activities based on the input of parent/teacher surveys and school staff, (b) prioritizing parent and student needs based on that input, and (c) developing a variety of materials and manipulative activities that met the needs of the parents, teachers and children.

A sample of a session lesson plan included: (a) Objectives for addition, subtraction, multiplication and division concepts and skills relating to solving problems with one and two digit numbers using manipulatives, (b) materials such as attribute blocks of various colors, sizes and shapes, base ten blocks, place value charts, chips, color tiles, count and sort kit, counting sticks, cuisenaire rods, pattern blocks, and unifix cubes, (c) activities for modeling, demonstrating, illustrating and providing a variety of examples for appropiate use of manipulatives, (d) evaluation to discuss and explain ways solutions were derived and the choice of manipulatives, and (e) extension activities that the parents and teachers could try with children between sessions (see Appendix L).

The third step included the development of agenda objective topics for each session to encourage the parents and teachers to attend. Agenda announcements were sent with training dates and times to all the Chapter I teachers and math students to carry home to parents. The agendas included a brief description of the goals and objectives. A reply was requested to be sent back to the practicum writer (see Appendix M). The Chapter I math students were encouraged to write invitation letters to their parents.

The assistance of the local newspaper and radio stations to advertise the training programs was solicited. Posters and flyers announcing the program were placed in nearby shopping centers and libraries. Finally, an attempt was made to contact all teachers and parents of children served in the Chapter I math program by phone at each school site. The purpose of the phone contact was to remind and confirm teachers' and parents' commitment to attend.

The fourth step was the implementation of the training program and the development of a clear definition of manipulatives to present to teachers and parents. The following definition was discussd at each training session to help parents and teachers understand the manipulative approach to remediating math and the strategies involved: Manipulatives consist of a variety of objects that the child can manipulate to assist with mathematical perceptions of concepts and skills. Manipulatives move the child from the abstract to the concrete.

The fifth and final step was the evaluation of the training program by parents and teachers. Their input helped the writer evaluate the training program's effectiveness and determine troublesome areas as well as future directions (see Appendix N).

Initial and final parent/teacher surveys were provided for them as an evaluation tool in determining whether the objectives were met.

The manipulative training program was conducted over an eight month period. The teachers and parents were invited to participate in six scheduled two hour training sessions at the four targeted practicum school sites.

The first month was devoted to reviewing initial parent teacher/tutor math student progress surveys, developing and organizing materials and activities, and scheduling meetings with target schools. The first week of this month was devoted to (a) developing lists of eligible Chapter I teachers and parents to participate in the program, (b) reviewing the initial parent/teacher surveys, (c) discussing the goals and objectives with the school staff, and (d) soliciting school support. The second week of the first month of implementation was devoted to scheduling and advertising. Plans were made to (a) utilize the local community school sites to conduct training workshops, (b) prepared letters and flyers that were sent to teachers and home to parents, and (c) contacted the local media, teachers and parents by phone. Week three and four were devoted to developing parent and teacher manipulative materials and activities for each session.

Suggestions and recommendations were requested from the Chapter I staff and math tutors in order to develop materials centered around specific skill concepts.

Months two through seven were devoted to conducting the math manipulative parent and teacher training sessions in the target practicum school sites. The first week of the month of implementation was devoted to conducting training workshops for practicum school sites A and B. The second week was devoted to follow-up observation by the practicum writer in the classroom and time set aside to visit and observe parent use of manipulatives to remediate the students in the home. Week three of the month was devoted to conducting workshops in practicum schools C and D. Week four of the month of implementation was devoted to follow-up observations in the classroom and in the home.

Month eight was devoted to observing manipulative application by parents and teachers, comparing and analyzing survey results, and developing a summary report. Thank you notes and certificates of participation were mailed to practicum parent and teacher participants who attend all the scheduled training workshop sessions. The parents and teachers were also mailed copies of the final summary report.

CHAPTER V

RESULTS, CONCLUSIONS AND RECOMMENDATIONS

Results

The results obtained reflect the projected outcome of the four objectives of this practicum discussed in Chapter III.

Objective One results were measured based on the parents' and teachers' indication of their understanding of the use of math manipulatives used by Chapter I math tutors with students to remediate basic addition skills.

The data for this objective was analyzed from comparing the results of the initial parent/teacher survey questions to the results of the questions from the final parent/teacher survey in Appendix C.

Table 3 summarizes the total percentage of 234 parent and 102 teacher inservice training participants who exhibited understanding of math manipulatives used by Chapter I math tutors to remediate basic addition skills from practicum schools A, B, C, and D.

Table 3.

Addition Manipulative Parent/Teacher Survey Results

Parent Items	Initial Responses of Understanding Exhibited/Lacked		Final Responses of Understanding Exhibited/Lacked		Total % Understanding Increased
1	0	234	234	0	100%
2	0	234	231	3	98%
3	0	234	233	1	99%
4	3	231	234	0	98%
5	12	222	234	0	94%
Combined Averaged Increase					97%

Teacher Items	Initial Responses of Understanding Exhibited/Lacked		Final Responses of Understanding Exhibited/Lacked		Total % Understanding Increased
1	20	82	102	0	82%
2	16	86	102	0	84%
3	10	92	102	0	90%
4	4	98	102	0	96%
5	18	84	102	0	92%
Combined Averaged Increase					88%
Combined Average Overall Parent/Teacher Increase					92%

Result percentages are rounded off.

The results from Table 3 reflect the majority (97%) of the parents and (88%) of teachers surpassed the predicted outcome of 75% for Objective One based on combined averages of the data collected from the survey question responses one through five. The parents and teachers were asked to complete an initial survey at the first training session and the final survey at the end of the last training session for each practicum school.

Table 3 also summarizes the combined average of the overall results (92%) increase of understanding exhibited by both parents and teachers. The results represented a 17% increase from the predicted 75% increase overall.

Objective two results were measured based on the parents' and teachers' indication of their understanding of the use of math manipulatives used by Chapter I math tutors with students to remediate basic subtraction skills.

The data for this objective was analyzed from comparing the results of the initial parent/teacher survey questions to the results of the questions from the final parent/teacher survey in Appendix D.

Table 4 summarizes the total percentage of 234 parent and 102 teacher inservice training participants who exhibited understanding of math manipulatives used

by Chapter I math tutors to remediate basic subtraction skills from practicum schools A, B, C, and D.

Table 4.

Subtraction Manipulative Parent/Teacher Survey Results

Parent Items	Initial Responses of Understanding Exhibited	Initial Responses of Understanding Lacked	Final Responses of Understanding Exhibited	Final Responses of Understanding Lacked	Total % Understanding Increased
1	0	234	229	5	97%
2	0	234	201	33	85%
3	0	234	230	4	98%
4	0	234	226	8	96%
5	0	234	234	0	100%
Combined Average Increase					95%

Teacher Items	Initial Responses of Understanding Exhibited	Initial Responses of Understanding Lacked	Final Responses of Understanding Exhibited	Final Responses of Understanding Lacked	Total % Understanding Increased
1	14	88	102	0	86%
2	10	92	102	0	90%
3	16	86	102	0	84%
4	8	94	102	0	92%
5	12	90	102	0	88%
Combined Average Increase					88%

Combined Average Overall Parent/Teacher Increase 91%

Result percentages are rounded off.

The results from Table 4 reflect the majority (95%) of the parents and (88%) of the teachers surpassed the predicted outcome of 75% for Objective Two based on combined averages of the data collected from the survey question responses one through five. The parents and teachers were asked to complete an initial survey at the first training session and the final survey of the end of the last training session for each practicum school.

Table 4 also summarizes the combined average of the overall results, (92%), an increase of understanding exhibited by both parents and teachers. The results represented a 16% increase above the predicted 75% increase overall.

Objective Three results were measured based on the parents' and teachers' indication of their understanding of the use of math manipulatives used by Chapter I math tutors with students to remediate basic multiplication skills. The data for this objective was analyzed from comparing the results of the initial parent/teacher survey questions to the results of the questions from the final parent/teacher survey in Appendix E.

Table 5 summarizes the total percentage of 234 parent and 102 teacher inservice training participants

who exhibited understanding of math manipulatives used by Chapter I math tutors to remediate basic multiplication skills from practicum school A, B, C, and D.

Table 5.

Multiplication Manipulative Parent/Teacher Survey Results

Parent Items	Initial Responses of Understanding Exhibited	Lacked	Final Responses of Understanding Exhibited	Lacked	Total % Understanding Increased
1	0	234	228	6	97%
2	0	234	234	0	100%
3	0	234	228	6	97%
4	0	234	234	0	100%
5	0	234	234	0	100%
Combined Average Increase					98%
Teacher Items	Initial Responses of Understanding Exhibited	Lacked	Final Responses of Understanding Exhibited	Lacked	Total % Understanding Increase
1	6	96	102	0	94%
2	9	93	102	0	91%
3	13	89	102	0	87%
4	5	97	102	0	95%
5	3	99	102	0	97%
Combined Average Increase					92%
Combined Average Overall Parent/Teacher Increase					95%

Result percentages are rounded off.

The results from Table 5 reflect the majority (98%) of the parents and (92%) of the teachers surpassed the predicted outcome of 75% for Objective Three based on combined averages of the data collected from the survey question responses one through five. The parents and teachers were asked to complete an initial survey at the first training session and the final survey at the end of the last training session for each practicum school.

Table 5 also summarizes the combined average of the overall results, (92%), an increase of understanding exhibited by both parents and teachers. The results represented a 20% increase above the predicted 75% increase overall.

Objective Four results were measured based on the parents' and teachers' indication of their understanding of the use of math manipulatives used by Chapter I math tutors with students to remediate basic division skills.

The data for this objective was analyzed from comparing the results of the initial parent/teacher survey questions to the results of the questions from the final parent/teacher survey in Appendix F.

Table 6 summarizes the total percentage of 234 parent and 102 teacher inservice training participants who exhibited understanding of the math manipulatives

used by Chapter I math tutors to remediate basic division skills from practicum schools A, B, C, and D.

Table 6.

Division Manipulative Parent/Teacher Survey Results

Parent Items	Initial Responses of Understanding Exhibited	Initial Responses of Understanding Lacked	Final Responses of Understanding Exhibited	Final Responses of Understanding Lacked	Total % Understanding Increased
1	0	234	224	10	95%
2	0	234	216	18	92%
3	0	234	201	33	85%
4	0	234	218	16	93%
5	0	234	226	8	96%
Combined Average Increase					92%

Teacher Items	Initial Responses of Understanding Exhibited	Initial Responses of Understanding Lacked	Final Responses of Understanding Exhibited	Final Responses of Understanding Lacked	Total % Understanding Increased
1	6	96	102	0	94%
2	11	91	102	0	89%
3	8	94	98	4	95%
4	4	98	98	4	100%
5	4	98	102	0	96%
Combined Average Increase					94%
Combined Average Overall Parent/Teacher Increase					93%

Result percentages are rounded off.

The results from Table 6 reflect the majority (92%) of the parents and (94%) of the teachers surpassed the predicted outcome of 75% for Objective Four based on combined averages of the data collected from the survey question responses one through five. The parents and teachers were asked to complete an initial survey at the first training session and the final survey at the end of the last training session for each practicum school.

Table 6 also summarizes the combined average of the overall results, (95%), an increase of understanding exhibited by both parents and teachers. The results represented an 18% increase above the predicted 75% increase overall.

At the end of the final training session, the parents and teachers from each school site completed a parent/teacher evaluation (see Appendix I). The following results in Table 7 reflect that the majority of the parent and teacher participants felt that the objectives of the manipulative inservice training program were successfully met.

Table 7.

Parent/Teacher Inservice Evaluation Results

Item	Excellent	%	Good	%	Fair	%	Poor	%
1	312	93%	15	40%	9	3%	0	
2	306	91%	22	7%	8	2%	0	
3	299	89%	33	10%	4	1%	0	
4	303	90%	26	8%	7	2%	0	
5	298	89%	35	10%	3	1%	0	
6	296	88%	32	10%	8	2%	0	
7	315	94%	17	5%	4	1%	0	
8	323	96%	8	2%	5	2%	0	
9	318	95%	10	3%	8	2%	0	
10	321	96%	12	3%	3	1%	0	

Result percentages are rounded off.

There was a 96% excellent rating by the parents and teachers who indicated that the activities were helpful and 2% rating of good for item number eight. The majority (96%) of the parent and teacher responses for item ten rated the inservice program excellent, and a 3% rating of good overall. There were no poor

ratings for any of the items evaluated by the parents and teachers from the four practicum schools.

Conclusions

The first objective was concerned with providing parents and teachers with an understanding of how to apply appropriate math manipulatives to remediate basic addition skills for students. This objective was met well above the anticipated section of this practicum. The writer used a variety of math manipulative examples of activities presented for the different elementary grade levels.

Young (1983) suggested that a variety of manipulatives and activities be introduced with which students have some familiarity to promote an atmosphere for creative problem solving using manipulatives. The manipulatives should be appropriate for the different levels and various degrees of abstraction.

The second objective was concerned with providing parents and teachers with an understanding of math manipulatives to remediate basic subtraction skills for students. This objective was met over the anticipated outcome. The inservice manipulatives presented to the parents and teachers showed them how children acquire subtraction skill through the use of appropriate

manipulatives. The children were provided with opportunities to learn through the use of different manipulatives to enhance subtraction skills. The parents and teachers were shown how to use counters, base-ten blocks, counting chips and unifix cubes to help children understand and restate subtraction problems using concrete objects.

Kennedy (1986) suggested that manipulatives that are appropriately selected can be used to teach a variety of math skills. Students form mental images based on their experiences with manipulatives that help them to be better able to internalize and apply ideas to new problem situations.

The third objective also evidenced tremendous success. The parents and teachers were introduced to math manipulatives that were appropriate for teaching and enhancing basic multiplication skills for students. The parents and teachers were encouraged to allow the children to handle chips, counters, and unifix cubes to illustrate how they could use manipulatives to show multiplication as repeated addition and grouping.

Suydam (1984) suggested that children should be active participants when using manipulatives. The children are given opportunities to handle concrete objects and talk about their experiences to see relationships and meaning.

The fourth and final objective was concerned with helping parents and teachers understand the use of manipulatives to remediate basic division skill for students. The anticipated outcome for this objective was met well over the predicted level of achievement. The writer had anticipated this objective to be the most difficult of the four, however, the writer was pleasantly surprised at how well the parents understood the concepts that were presented by the writer for this objective. The parents and teachers were shown how to use color tiles, unifix cubes, chips and counters to represent the problem as multiplication and by grouping to help them understand the process.

The writer introduced the process suggested by Bright (1986) which involved general utilization of appropriate manipulatives to teach multiple concepts. The students must be provided with manipulative learning experiences to help them understand the connection between concrete object and symbols. The process included plenty of opportunities for the children to construct and build on their experiences so that the message was understood.

The implication is clear that children will be the ones to benefit from the collaboration of teachers and parents to encourage the importance of the utilization of manipulatives in daily math lesson plans. Parent

and teachers can help children develop a deeper appreciation for math concepts and provide a good environment with a variety of manipulatives through guidance and support from the school. Parents and teachers can serve as important role models in guiding their children toward success in math through the use of manipulatives.

In summary, this practicum proved that the development of a math manipulative inservice training program provided consistency in the Chapter I math program between home and school. By participating in the program, the parents and teachers developed a better understanding of how the children learn and how manipulatives are utilized by Chapter I tutors to remediate and motivate children to learn basic math concepts. The writer intends to share the parents' and teachers' feedback of the most successful manipulatives utilized at home and school with their children at future parent and teacher training sessions. The program demonstrated the important roles that the parents and teachers play in the success of their children as well as reinforcing the partnership between the home and the school.

Recommendations

The writer has five specific recommendations based on the results of this practicum. First, schools with Chapter I programs should provide parent and teacher inservice activities designed to acquaint them with math manipulatives and methodologies. Second, make available a library of manipulatives and related materials for parent and teacher check-out. Third, offer opportunities for parents and teachers to understand appropriate manipulatives to remediate math skills at the level their children are working. Fourth, provide manipulative activities to reinforce skills taught in the classroom. Finally, provide for parental and teacher collaboration in the planning, implementation and evaluation of the program.

This practicum writer plans to conduct manipulative parent and teacher inservice training programs on a regularly scheduled basis at the local school and district levels. Second, he plans to design and develop a parent and teacher workshop at the school level for parent and teacher training on how to make and use manipulative reinforcement materials with their children. Third, he will make available a library of manipulatives, free packets of manipulative ideas, and suggestions and current research related to parent and

teacher involvement. Finally, the writer plans to work with principals and Chapter I teachers to plan parent visits to schools to observe how manipulatives are used to remediate their children in the Chapter I classroom.

Dissemination

Plans for dissemination and networking include sharing the results of this practicum with Chapter I project administrator, program consultants and district resource teachers. Further plans include presenting a brief overview of the practicum results to the Chapter I district parent advisory council composed of parent representatives from each Chapter I school.

The practicum writer plans to visit with local Chapter I school principals and present a brief overview of the practicum results. The practicum results will be shared with Chapter I teachers and tutors at several scheduled cluster meetings throughout the county.

A request will be made by the practicum writer to present the practicum results in the winter and spring editions of the Chapter I newsletters that are published monthly. The newsletters are distributed to the elementary department district administrative staff, local Chapter I school principals, teachers and parents.

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APPENDIX A

PARENT SURVEY

CHAPTER I

PARENT SURVEY

1988-1989

Interview # _____

Telephone # of Respondents: _____

Interviewer: _____
Child's Grade _____
Date of Interview: _____ Time: _____

We're conducting a survey to give school officials a general picture of public opinion on the Chapter I program. Your number was chosen at random, and your answers will remain completely confidential. My questions will take about five minutes.

	Yes	No
1. Is your child presently receiving Chapter I math service?	___	___
2. Do you understand the purpose of the Chapter I math manipulative program in your child's school?	___	___
3. Have you ever participated in a chapter I Math manipulative workshop?	___	___
4. Have you observed your child during a Chapter I math lesson?	___	___
5. Do you understand the manipulative approach to doing basic math skills?	___	___
6. Would you like to participate in a math manipulative training program?	___	___
7. Would you like more information about the use of manipulatives to reinforce basic math skills?	___	___

8. What comments would you like to offer about the Chapter I math manipulative program?

_____

_____

_____

APPENDIX B

DISTRICT ADVISORY COUNCIL MINUTES AND SUMMARY SURVEY

ORANGE COUNTY PUBLIC SCHOOLS

CHAPTER I

DISTRICT ADVISORY COUNCIL MINUTES

TUESDAY, NOVEMBER 15, 1988

The first DAC meeting for the 1988-89 school year was held at 7 p.m. in the Orange County School Board Meeting Room at 434 North Tampa Avenue.

Twenty-six parents were welcomed and introduced to the Chapter I staff by Mr. Allen, Program Coordinator of the Chapter I Parent Education Program.

Mrs. Ward, Program Consultant of Chapter I, explained the overview of the 1988-89 Chapter I program and the 1987-88 evaluation results of the program. Mrs. Ward then answered questions parents had in regards to the program.

Mr. Allen explained the Parent Involvement policy and what Chapter I Parent Education has to offer parents. Mr. Allen extended an open invitation to all parents to attend the Chapter I Grand Opening for the new Parent Resource Center at 1011 East Colonial Drive on November 17, 1988.

A parent survey was handed out and explained to the parents. The surveys were numbered and used to draw for door prizes consisting of floral arrangements and books.

Mrs. Ward and Mr. Allen explained the two ways of holding DAC meetings; by electing officers and holding meetings or have two meetings a year as we are presently doing. The parents voted to continue with two meetings a year.

A motion to adjourn was made by Mr. Scarbourgh, and Mrs. Barber seconded the motion.

The meeting adjourned at 8:30 p.m. after which everyone enjoyed refreshments, viewed parent display materials, and received handouts.

Robert Allen
(Chapter I Parent Coordinator)

(Chapter I Senior Administrator)

9/mf/152
11/28/88

PARENT SURVEY
1988-89

The following survey summary reflects the results of 24 parent respondents attending the November 15, 1988 District Advisory Council meeting.

	YES	NO	No Comments
1. Do you understand the purpose of the Chapter I program?			
2. Have you visited the Chapter I program at your child's school this year?			
3. Has your child brought home the Chapter I monthly calendars this year?			
4. Are you aware that the Chapter I program provides workshops for parents?			
5. Have you ever attended a chapter I workshop?			
6. Do you have any suggestions on the type of workshop you would like to attend?			

a) Please explain:_____
_____

7. Are you satisfied with the Chapter I reading program?

a) Please explain:_____
_____

8. Are you satisfied with the Chapter I math program?

   a) Please explain:_____
   _____

9. Have you received information about the Chapter I Take-Home Computer program this year?

   a) Please explain:_____
   _____

APPENDIX C

CHAPTER I MATH MANIPULATIVE
PRE AND POST PARENT/TEACHER SURVEY
1989-1990
BASIC ADDITION

Chapter I Math Manipulative

Pre and Post Parent/Teacher Survey

1989-1990

Basic Addition

This survey is designed to see how well you understand the use of math manipulatives used by Chapter I math tutors to remediate math skills.

Please select the appropriate survey category that applies to you, and respond to the questions.

Parent

1. What are some ways you can represent addition facts using objects at home?

_____

_____

_____

2. Explain how you can use manipulatives to add two-digit numbers.

_____

_____

_____

3. Explain how you would use manipulatives to demonstrate place value remediation.

_____

_____

_____

4. What argument can you give to support the use of manipulatives in the home?

5. Describe your child's attitude toward math as a result of using manipulatives in the home to remediate basic addition skills?

Teacher

1. What are some ways manipulatives can be used to help students with addition skills?

2. Why do you think that an increase in the use of manipulatives will help your students master addition skills?

3. Explain some ways you could demonstrate basic addition with the use of manipulatives in your classroom math lessons.

_____

_____

_____

4. Describe how confident you are in the use of appropriate manipulatives to teach or remediate basic addition skills.

_____

_____

_____

5. Describe your students' attitudes toward math as a result of using manipulatives to teach or remediate basic addition skills.

_____

_____

_____

APPENDIX D

CHAPTER I MATH MANIPULATIVES
PRE AND POST PARENT/TEACHER SURVEY
1989-1990
BASIC SUBTRACTION

Chapter I Math Manipulatives

Pre and Post Parent/Teacher Survey

1989-1990

Basic Subtraction

This survey is designed to see how well you understand the use of math manipulatives used by Chapter I math tutors to remediate math skills.

Please select the appropriate survey category that applies to you, and respond to the questions.

Parent

1. What are some ways you can represent subtraction skills using objects at home?

_____

_____

_____

2. Explain how you can use manipulatives to subtract using two-digit numbers.

_____

_____

_____

3. Describe how confident you feel about the use of appropriate manipulatives in the home to remediate subtraction skills.

_____

_____

4. Describe how you can apply several different manipulatives to help your child master subtraction skills.

5. Describe your child's attitude toward math as a result of using manipulatives at home to remediate basic subtraction skills.

Teacher

1. What are some ways manipulatives can be used to help teach or remediate students in subtraction skills?

2. Why do you think that an increase in the use of manipulatives will help students with subtraction skills?

3. What are some ways you can demonstate basic subtraction with the use of manipulatives in your math lessons?

4. Describe how confident you are in using appropriate manipulatives to teach or remediate basic subtraction skills.

5. Describe your students' attitudes toward math as a result of using manipulatives to teach or remediate basic subtraction skills.

APPENDIX E

CHAPTER I MATH MANIPULATIVES
PRE AND POST PARENT/TEACHER SURVEY
1989-1990
BASIC MULTIPLICATION

Chapter I Math Manipulatives

Pre and Post Parent/Teacher Survey

1989-90

Basic Multiplication

This survey is designed to see how well you understand the use of math manipulatives used by Chapter I math tutors to remediate math skills.

Please select the appropriate survey category that applies to you, and respond to the questions.

Parent

1. What are some ways you can represent multiplication facts using objects at home?

_____

_____

_____

2. What are some ways you can use manipulatives to demonstrate multiplication as repeated addition?

_____

_____

_____

3. Describe how confident you feel about the use of appropriate manipulatives in the home to remediate multiplication skills.

_____

_____

4. Describe how you feel about the use of manipulatives to help your child master multiplication skills.

5. Describe your child's attitude toward math as a result of using manipulatives at home to remediate basic multiplication skills.

Teacher

1. What are some ways manipulatives may be used to help teach or remediate students in multiplication skills?

2. Why do you think that an increase in the use of manipulatives will help students with multiplication?

3. What are some ways you can demonstrate basic multiplication with the use of manipulatives in your math lessons?

4. Describe how confident you are in using appropriate manipulatives to teach or remediate basic multiplication skills.

5. Describe your students' attitude toward math as a result of using manipulatives to teach or remediate multiplication skills.

APPENDIX F

CHAPTER I MATH MANIPULATIVES
PRE AND POST PARENT/TEACHER SURVEY
1989-1990
BASIC DIVISION

Chapter I Math Manipulatives

Pre and Post Parent/Teacher Survey

1989-1990

Basic Division

This survey is designed to see how well you understand the use of math manipulatives used by Chapter I math tutors to remediate math skills.

Please select the appropriate survey category that applies to you, and respond to the question.

Parent

1. What are some ways you can represent division facts using objects at home?

_____

_____

_____

2. Explain how you could use manipulatives to divide by one digit number with the answer less than ten and no remainder.

_____

_____

_____

3. Explain how you would demonstrate with manipulatives the division of any one digit number by a two-digit number.

4. What reason can you state to support the use of manipulatives in the home for remediation of division skills?

5. Describe your child's attitude toward math as a result of using manipulatives in the home to remediate basic division skills.

Teacher

1. What are some ways manipulatives can be used in a math lesson to help students with division skills?

2. Why do you think that an increase in the use of manipulatives will help your students master division skills?

3. Explain how you would use manipulatives to demonstrate basic division skills.

4. Describe how confident you are in the use of appropriate manipulatives to teach and remediate basic skills.

5. Describe your students' attitudes toward math as a result of the use of manipulatives to teach or remediate basic division skills.

APPENDIX G

SUPPORTING SESSION MATERIALS

Manipulative Overview

Parents and teachers were made aware that no single manipulative thoroughly teaches a mathematical concept. The introduction of a variety of manipulatives will enhance the child's perception of math as the child use manipulatives to move from the abstract to the concrete.

The following were introduced with brief description of their use:

UNIFIX CUBES

The unifix cubes consist of interlocking cubes in 10 colors. Unifix cubes may be used to demonstrate number concepts, numeration, place value, and the four basic operations.

COLOR TILES

Color tiles are a set of brightly colored yellow, blue, red and green plastic squares. They may be used to enhance the child's understanding of basic math operations and problem solving.

CUISENAIRE RODS

The cuisenaire rods consist of 10 different color rods that progress from 1 to 10 cm in length. The rods may be used to demonstrate math concepts, all basic operations, place value, and numeration.

BASE TEN BLOCKS

Base ten blocks are a set of cubes showing base relationshops. They may be used to demonstrate place value, addition, subtraction, multiplication and division.

COUNTING STICKS

Counting sticks are small wooden sticks about 10 cm long and 2 cm wide. They may be used to teach counting, place value, and basic math operations.

CHIPS

Chips come in different colors and may be used for developing place values and basic operations.

ABACUS

The abacus is a frame holding parallel rod strung with movable counters. The abacus may be used to teach place value, addition and subtraction.

Manipulative Inservice

Session Activity Sheet

(Check One)

_____ Addition

_____ Subtraction

_____ Multiplication

_____ Division

Objective:

Materials:

Activity:

Extension:

Notes:

Manipulative Inservice

(Sample) Activity

(Check One)

__X__ Addition

_____ Subtraction

_____ Multiplication

_____ Division

Objective: Adding two digit numbers.

Materials: Place value charts or mats
base ten blocks, chips or unifix cubes

Activity: Have the students show any two-digit numbers on the place value chart or mat different ways.

Extension: Place value chart may be used to illustrate three and four-digit numbers.

Notes:

Manipulative Inservice

(Sample) Activity

(Check One)

_____ Addition

__X__ Subtraction

_____ Multiplication

_____ Division

Objective: To subtract one-digit numbers

Materials: Unifix cubes
Die

Activity: Give the student a number less than ten. Have the student roll the die to create a subtraction problem. Have the student record and solve the problem by taking cubes away.

Extension: Unifix cubes and counters can be used to restate subtraction problems as addition problems.

Notes:

Manipulative Inservice

(Sample) Activity

(Check One)

_____ Addition

_____ Subtraction

___X___ Multiplication

_____ Division

Objective: Demonstrate multiplication as repeated addition

Materials: Chips or counters
cups or egg cartons

Activity: Have students place the same amount of chips or counters in several cups or egg cartons. Repeat sets to illustrate multiplication as repeated addition.

Extension: Students can use counters and unifix cubes to demonstrate multiplication as grouping

Notes:

Manipulative Inservice

(Sample) Activity

(Check One)

_____ Addition

_____ Subtraction

_____ Multiplication

__X__ Division

Objective: To divide by a one digit number by representing the problem as a multiplication problem.

Materials: Color tiles
Graph paper

Activity: Have the students use color tiles and graph paper to demonstrate the problem and find the missing factor. Then have the students represent division problem as a multiplication problem.

Extension: Have the student use unifix cubes to represent the problem by grouping.

Notes:

APPENDIX H

INSERVICE PROGRAM
AGENDA ANNOUNCEMENT

Chapter I
Math Manipulative
Parent/Teacher Inservice Program

School Site

Date: _____
Time: _____

Session Agenda

I. Welcome and Overview of the Math Manipulative Inservice Program objectives.

II. Definition of Manipulative

III. Introduction of How to Use Manipulatives for Remediation of Basic Addition Skills.

IV. Introduction of How to Use Manipulatives for Remediation of Basic Subtraction Skills.

V. Introduction of How to Use Manipulatives for Remediation of Basic Multiplication Skills.

VI. Introduction of How to Use Manipulatives for Remediation of Basic Division Skills.

(For more information, contact Bob Allen at 656-4777)

Please detach and return to the Chapter I Teacher.

___ Yes, I will attend ___ No, I cannot attend

APPENDIX I

PARENT/TEACHER EVALUATION FORM

Parent Inservice Evaluation Form

Activity Title: _____

Date: _____

1. = EXCELLENT

2. = GOOD

3. = FAIR

4. = POOR

1.	Were the objectives clearly defined?	1 2 3 4
2.	How would you rate the organization of the manipulative activities?	1 2 3 4
3.	How would you rate the manipulative activities presented for basic addition?	1 2 3 4
4.	How would you rate the manipulative activities presented for basic subtraction?	1 2 3 4
5.	How would you rate the manipulative activities for basic multiplication?	1 2 3 4
6.	How would you rate the manipulative activities for basic division?	1 2 3 4
7.	How would you rate the interest level of the manipulative activities presented?	1 2 3 4
8.	Were the manipulatives presented for the activities helpful?	1 2 3 4
9.	Were there sufficient use of manipulative activities used to clarify concepts?	1 2 3 4
10.	How would you rate this inservice activity overall?	1 2 3 4